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XXXI. *Experiments and Observations on the Singing of Birds, by the Hon. Daines Barrington, Vice Pres. R. S. In a Letter to Mathew Maty, M. D. Sec. R. S.*

Read April 22, May 6, and May 13, 1773.

January 10, 1773.

DEAR SIR,

AS the experiments and observations I mean to lay before the Royal Society relate to the singing of birds, which is a subject that hath never before been scientifically treated of *, it may not be improper to prefix an explanation of some uncommon terms, which I shall be obliged to use, as well as others which I have been under a necessity of coining.

To *chirp*, is the first sound which a young bird utters, as a cry for food, and is different in all nestlings, if accurately attended to ; so that the hearer may distinguish of what species the birds are, though the nest may hang out of his sight and reach.

* Kircher, indeed, in his *Musurgia*, hath given us some few passages in the song of the nightingale, as well as the call of a quail and tuckow, which he hath engraved in musical characters. These instances, however, only prove that some birds have in their song, notes which correspond with the intervals of our common scale of the musical octave.

This

This cry is, as might be expected, very weak and querulous; it is dropped entirely as the bird grows stronger, nor is afterwards intermixed with its song, the *chirp* of a nightingale (for example) being hoarse and disagreeable.

To this definition of the *chirp*, I must add, that it consists of a single sound, repeated at very short intervals, and that it is common to nestlings of both sexes.

The *call* of a bird, is that sound which it is able to make, when about a month old; it is, in most instances (which I happen to recollect), a repetition of one and the same note, is retained by the bird as long as it lives, and is common, generally, to both the cock and hen*.

The next stage in the notes of a bird is termed, by the bird-catchers, *recording*, which word is probably derived from a musical instrument, formerly used in England, called a recorder†.

This attempt in the nestling to sing, may be compared to the imperfect endeavour in a child to babble. I have known instances of birds beginning to *record* when they were not a month old.

* For want of terms to distinguish the notes of birds, Bellon applies the verb *chantent*, or sing, to the goose and crane, as well as the nightingale. “*Plusieurs oiseaux chantent la nuit, comme est l’oye, la grue, & le rossignol.*” Bellon’s Hist. of Birds, p. 50.

† It seems to have been a species of flute, and was probably used to teach young birds to pipe tunes.

Lord Bacon describes this instrument to have been strait, to have had a lesser and greater bore, both above and below, to have required very little breath from the blower, and to have had what he calls a *fipple*, or stopper. See his second Century of Experiments.

This first essay does not seem to have the least rudiments of the future song; but as the bird grows older and stronger, one may begin to perceive what the nestling is aiming at.

Whilst the scholar is thus endeavouring to form his song, when he is once sure of a passage, he commonly raises his tone, which he drops again when he is not equal to what he is attempting; just as a singer raises his voice, when he not only recollects certain parts of a tune with precision, but knows that he can execute them.

What the nestling is not thus thoroughly master of, he hurries over, lowering his tone, as if he did not wish to be heard, and could not yet satisfy himself.

I have never happened to meet with a passage in any writer, which seems to relate to this stage of singing in a bird, except, perhaps, in the following lines of Statius :

“ ———Nunc volucrum novi

“ Questus, inexpertumque carmen,

“ Quod tacitâ statuere brumâ.”

Stat. Sylv. L. iv. Ecl. 5.

A young bird commonly continues to *record* for ten or eleven months, when he is able to execute every part of his song, which afterwards continues fixed, and is scarcely ever altered.

When the bird is thus become perfect in his lesson, he is said to *sing his song round*, or in all its varieties of passages, which he connects together, and executes without a pause.

I would therefore define a bird's *song* to be a succession of three or more different notes, which are continued without interruption during the same interval with a musical bar of four crotchets in an adagio movement, or whilst a pendulum swings four seconds.

By the first requisite in this definition, I mean to exclude the call of a cuckow, or *clucking* of a hen *, as they consist of only two notes; whilst the short bursts of singing birds, contending with each other (called *jerks* by the bird-catchers), are equally distinguished from what I term *song*, by their not continuing for four seconds.

As the notes of a cuckow and hen, therefore, though they exceed what I have defined the *call* of a bird to be, do not amount to its *song*, I will, for this reason, take the liberty of terming such a succession of two notes as we hear in these birds, the *varied call*.

Having thus settled the meaning of certain words, which I shall be obliged to make use of, I shall now proceed to state some general principles with regard to the singing of birds, which seem to result from the experiments I have been making for several years, and under a great variety of circumstances.

Notes in birds are no more innate, than language is in man, and depend entirely upon the master under which they are bred, as far as their organs will enable them to imitate the sounds which they have frequent opportunities of hearing.

* The common hen, when she lays, repeats the same note very often, and concludes with the sixth above, which she holds for a longer time.

Most of the experiments I have made on this subject have been made with cock linnets, which were fledged and nearly able to leave their nest, on account not only of this bird's docility, and great powers of imitation, but because the cock is easily distinguished from the hen at that early period, by the superior whiteness in the wing *.

In many other sorts of singing birds the male is not at the age of three weeks so certainly known from the female; and if the pupil turns out to be a hen,

“ ——— ibi omnis

“ Effusus labor.”

The Greek poets made a songster of the *τετλιξ*, whatever animal that may be, and it is remarkable that they observed the female was incapable of singing as well as hen birds :

Εἴτ' εἰσιν οἱ τετλιγες καὶ εὐδαιμονες,

Ὡν ταῖς γυναιξίν εἰς δ' ὅτιεν φωνῆς ἐνι;

Comicorum Græcorum Sententiæ, p. 452.

Ed. Steph.

I have indeed known an instance or two of a hen's making out something like the song of her species; but these are as rare as the common hen's being heard to crow.

I rather suspect also, that those parrots, magpies, &c. which either do not speak at all, or very little, are hens of those species.

* The white reaches almost to the shaft of the quill feathers, and in the hen does not exceed more than half.

I have educated nestling linnets under the three best singing larks, the *skylark*, *woodlark*, and *titlark*, every one of which, instead of the linnet's song, adhered entirely to that of their respective instructors.

When the note of the *titlark-linnet* * was thoroughly *fixed*, I hung the bird in a room with two common linnets, for a quarter of a year, which were full in song; the *titlark-linnet*, however, did not borrow any passages from the linnet's song, but adhered steadfastly to that of the titlark.

I had some curiosity to find out whether an European nestling would equally learn the note of an African bird: I therefore educated a young linnet under a *vengolina* †, which imitated its African master so exactly, without any mixture of the linnet song, that it was impossible to distinguish the one from the other.

This *vengolina-linnet* was absolutely perfect, without ever uttering a single note by which it could have been known to be a linnet. In some of my other experiments, however, the nestling linnet retained the *call* of its own species, or what the bird-

* I thus call a bird which sings notes he would not have learned in a wild state; thus by a *skylark-linnet*, I mean a linnet with the skylark song; a *nightingale robin*, a robin with the nightingale song, &c.

† This bird seems not to have been described by any of the ornithologists; it is of the *finch* tribe, and about the same size with our aberdavine (or fiskin). The colours are grey and white, and the cock hath a bright yellow spot upon the rump. It is a very familiar bird, and sings better than any of those which are not European, except the American *mocking bird*.

catchers term the linnet's *cbuckle*, from some resemblance to that word when pronounced.

I have before stated, that all my nestling linnets were three weeks old, when taken from the nest; and by that time they frequently learn their *own call* from the parent birds, which I have mentioned to consist of only a single note.

To be certain, therefore, that a nestling will not have even the *call* of its species, it should be taken from the nest when only a day or two old; because, though nestlings cannot see till the seventh day, yet they can hear from the instant they are hatched, and probably, from that circumstance, attend to sounds, more than they do afterwards, especially as the call of the parents announces the arrival of their food.

I must own, that I am not equal myself, nor can I procure any person to take the trouble of breeding up a bird of this age, as the odds against its being reared are almost infinite. The warmth indeed of incubation may be, in some measure, supplied by cotton and fires; but these delicate animals require, in this state, being fed almost perpetually, whilst the nourishment they receive should not only be prepared with great attention, but given in very small portions at a time.

Though I must admit, therefore, that I have never reared myself a bird of so tender an age, yet I have happened to see both a linnet and a goldfinch which were taken from their nests when only two or three days old.

The first of these belonged to Mr. Matthews, an apothecary at Kensington, which, from a want of
other.

other sounds to imitate, almost articulated the words *pretty boy*, as well as some other short sentences: I heard the bird myself repeat the words *pretty boy*; and Mr. Matthews assured me, that he had neither the note or call of any bird whatsoever.

This talking linnet died last year, and many people went from London to hear him speak.

The goldfinch I have before mentioned, was reared in the town of Knighton in Radnorshire, which I happened to hear, as I was walking by the house where it was kept.

I thought indeed that a *wren* was singing; and I went into the house to inquire after it, as that little bird seldom lives long in a cage.

The people of the house, however, told me, that they had no bird but a goldfinch, which they conceived to sing its own natural note, as they called it; upon which I staid a considerable time in the room, whilst its notes were merely those of a *wren*, without the least mixture of goldfinch.

On further inquiries, I found that the bird had been taken from the nest when only two or three days old, that it was hung in a window which was opposite to a small garden, whence the nestling had undoubtedly acquired the notes of the wren, without having had any opportunity of learning even the *call* of the goldfinch.

These facts which I have stated seem to prove very decisively, that birds have not any innate ideas of the notes which are supposed to be peculiar to each species. But it will possibly be asked, why in a wild state they adhere so steadily to the same song,
in

in so much that it is well known, before the bird is heard, what notes you are to expect from him.

This, however, arises entirely from the nestling's attending only to the instruction of the parent bird, whilst it disregards the notes of all others, which may perhaps be singing round him.

Young Canary-birds are frequently reared in a room where there are many other sorts; and yet I have been informed that they only learn the song of the parent cock.

Every one knows, that the common house-sparrow, when in a wild state, never does any thing but chirp: this, however, does not arise from want of powers in this bird to imitate others; but because he only attends to the parental note.

But, to prove this decisively, I took a common Sparrow from the nest when it was fledged, and educated him under a linnet: the bird, however, by accident heard a goldfinch also, and his song was, therefore, a mixture of the linnet and goldfinch.

I have tried several experiments, in order to observe from what circumstances birds fix upon any particular note when taken from the parents; but cannot settle this with any sort of precision, any more than at what period of their *recording* they determine upon the song to which they will adhere.

I educated a young robin under a very fine Nightingale; which, however, began already to be out of song, and was perfectly mute in less than a fortnight.

This robin afterwards sung three parts in four *nightingale*; and the rest of his song was what the
bird-

bird-catchers call *rubbish*, or no particular note whatsoever.

I hung this robin nearer to the nightingale than to any other bird; from which first experiment I conceived, that the scholar would imitate the master which was at the least distance from him.

From several other experiments, however, which I have since tried, I find it to be very uncertain what notes the nestling will most attend to, and often their song is a mixture; as in the instance which I before stated of the sparrow.

I must own also, that I conceived, from the experiment of educating the robin under a nightingale, that the scholar would fix upon the note which it first heard when taken from the nest; I imagined likewise, that, if the nightingale had been fully in song, the instruction for a fortnight would have been sufficient.

I have, however, since tried the following experiment, which convinces me, so much depends upon circumstances, and perhaps caprice in the scholar, that no general inference, or rule, can be laid down with regard to either of these suppositions.

I educated a nestling robin under a woodlark-linnet, which was full in song, and hung very near to him for a month together: after which, the robin was removed to another house, where he could only hear a skylark-linnet. The consequence was that the nestling did not sing a note of woodlark (though I afterwards hung him again just above the wood-lark-linnet) but adhered entirely to the song of the skylark-linnet.

Having

Having thus stated the result of several experiments, which were chiefly intended to determine, whether birds had any innate ideas of the notes, or song, which is supposed to be peculiar to each species, I shall now make some general observations on their singing; though perhaps the subject may appear to many a very minute one.

Every poet, indeed, speaks with raptures of the harmony of the groves; yet those even, who have good musical ears, seem to pay little attention to it, but as a pleasing noise.

I am also convinced (though it may seem rather paradoxical), that the inhabitants of London distinguish more accurately, and know more on this head, than of all the other parts of the island taken together.

This seems to arise from two causes.

The first is, that we have not more musical ideas which are innate, than we have of language; and therefore those even, who have the happiness to have organs which are capable of receiving a gratification from this sixth sense (as it hath been called by some) require, however, the best instruction.

The orchestra of the opera, which is confined to the metropolis, hath diffused a good stile of playing over the other bands of the capital, which is, by degrees, communicated to the fidler and ballad-singer in the streets; the organs in every church, as well as those of the Savoyards, contribute likewise to this improvement of musical faculties in the Londoners.

If the singing of the ploughman in the country is therefore compared with that of the London black-

guard, the superiority is infinitely on the side of the latter ; and the same may be observed in comparing the voice of a country girl and London house-maid, as it is very uncommon to hear the former sing tolerably in tune.

I do not mean by this, to assert that the inhabitants of the country are not born with as good musical organs ; but only, that they have not the same opportunities of learning from others, who play in tune themselves.

The other reason for the inhabitants of London judging better in relation to the song of birds, arises from their hearing each bird sing distinctly, either in their own or their neighbours shops ; as also from a bird continuing much longer in song whilst in a cage, than when at liberty ; the cause of which I shall endeavour hereafter to explain.

Those who live in the country, on the other hand, do not hear birds sing in their woods for above two months in the year, when the confusion of notes prevents their attending to the song of any particular bird ; nor does he continue long enough in a place, for the hearer to recollect his notes with accuracy.

Besides this, birds in the spring sing very loud indeed ; but they only give short jerks, and scarcely ever the whole compass of their song.

For these reasons, I have never happened to meet with any person, who had not resided in London, whose judgement or opinion on this subject I could the least rely upon ; and a stronger proof of this cannot be given, than that most people, who keep Canary

nary-birds do not know that they sing chiefly either the titlark, or nightingale notes *.

Nothing, however, can be more marked than the note of a nightingale called its *jug*, which most of the Canary-birds brought from the Tyrol commonly have, as well as several nightingale *strokes*, or particular passages in the song of that bird.

I mention this superior knowledge in the inhabitants of the capital, because I am convinced, that, if others are consulted in relation to the singing of birds, they will only mislead, instead of giving any material or useful information †.

Birds in a wild state do not commonly sing above ten weeks in the year ; which is then also confined to the cocks of a few species ; I conceive, that this last

* I once saw two of these birds which came from the Canary islands ; neither of which had any song at all ; and I have been informed, that a ship brought a great many of them not long since, which sung as little.

Most of those Canary-birds, which are imported from the Tyrol, have been educated by parents, the progenitor of which was instructed by a nightingale ; our English Canary-birds have commonly more of the titlark note.

The traffick in these birds makes a small article of commerce, as four Tyroleze generally bring over to England sixteen hundred every year ; and though they carry them on their backs one thousand miles, as well as pay 20l. duty for such a number, yet upon the whole it answers to sell these birds at 5s. a piece.

The chief place for breeding Canary-birds is Inspruck and its environs, from whence they are sent to Constantinople, as well as every part of Europe.

† As it will not answer to catch birds with clap-nets any where but in the neighbourhood of London, most of the birds which may be heard in a country town are nestlings, and consequently cannot sing the supposed natural song in any perfection.

circumstance arises from the superior strength of the muscles of the larynx.

I procured a cock nightingale, a cock and hen blackbird, a cock and hen rook, a cock linnet, as also a cock and hen chaffinch, which that very eminent anatomist, Mr. Hunter, F. R. S. was so obliging as to dissect for me, and begged, that he would particularly attend to the state of the organs in the different birds, which might be supposed to contribute to singing.

Mr. Hunter found the muscles of the larynx to be stronger in the nightingale than in any other bird of the same size; and in all those instances (where he dissected both cock and hen) that the same muscles were stronger in the cock.

I sent the cock and hen rook, in order to see whether there would be the same difference in the cock and hen of a species which did not sing at all. Mr. Hunter, however, told me, that he had not attended so much to their comparative organs of voice, as in the other kinds; but that, to the best of his recollection, there was no difference at all.

Strength, however, in these muscles, seems not to be the only requisite; the birds must have also great plenty of food, which seems to be proved sufficiently by birds in a cage singing the greatest part of the year, when the wild ones do not (as I observed before) continue in song above ten weeks.

The food of singing birds consists of plants, insects, or seeds, and of the two first of these there is infinitely the greatest profusion in the spring.

As for seeds, which are to be met with only in the autumn, I think they cannot well find any great quantities

quantities of them in a country so cultivated as England is; for the seeds in meadows are destroyed by mowing; in pastures, by the bite of the cattle; and in arable, by the plough, when most of them are buried too deep for the bird to reach them *.

I know well that the singing of the cock-bird in the spring is attributed by many † to the motive only of pleasing its mate during incubation.

Those, however, who suppose this, should recollect, that much the greater part of birds do not sing at all: why should their mate therefore be deprived of this solace and amusement?

The bird in a cage, which, perhaps, sings nine or ten months in a year, cannot do so from this inducement; and, on the contrary, it arises chiefly from contending with another bird, or indeed against almost any sort of continued noise.

Superiority in song gives to birds a most amazing ascendancy over each other; as is well known to the bird-catchers by the fascinating power of their call-birds, which they contrive should moult prematurely for this purpose.

But, to shew decisively that the singing of a bird in the spring does not arise from any attention to its mate, a very experienced catcher of nightingales hath informed me, that some of these birds have *jerked* the instant they were caught. He hath also brought

* The plough indeed may turn up some few seeds, which may still be in an eatable state.

† See, amongst others, M. de Buffon, in his lately-published *Ornithology* .

to me a nightingale, which had been but a few hours in a cage, and which burst forth in a roar of song.

At the same time this bird is so sulky on its first confinement, that he must be crammed for seven or eight days, as he will otherwise not feed himself: it is also necessary to tie his wings, to prevent his killing himself against the top or sides of the cage.

I believe there is no instance of any bird's singing which exceeds our blackbird in size; and possibly this may arise from the difficulty of its concealing itself, if it called the attention of its enemies, not only by bulk, but by the proportionable loudness of its notes*.

I should rather conceive, it is for the same reason that no hen-bird sings, because this talent would be still more dangerous during incubation; which may possibly also account for the inferiority in point of plumage.

I shall now consider how far the singing of birds resembles our known musical intervals, which are never marked more minutely than to half notes; because, though we can form every gradation from half-note to half-note, by drawing the finger gently over the string of a violin, or covering by degrees the hole of a flute; yet we cannot produce such a minute interval at command, when a quarter-note for example might be required.

Ligon, indeed, in his history of Barbadoes, hath the following passage: "The next bird is of the co-

* For the same reason, most large birds are wilder than the smaller ones.

“lour of the fieldfare; but the head is too large
 “for the body; and for that reason she is called a
 “counsellor. She performs that with her voice,
 “which no instrument can play, or voice can sing;
 “and that is quarter-notes, her song being composed
 “of them, and every one a note higher than another.”
 Hist. Barb. p. 60.

Ligon appears, from other parts of his work, to have been musical; but I should doubt much whether he was quite sure of these quarter intervals, so as to speak of them with precision.

Some passages of the song in a few kinds of birds correspond with the intervals of our musical scale (of which the cuckow is a striking and known instance): much the greater part, however, of such song is not capable of musical notations.

This arises from three causes: the first is, that the rapidity is often so great, and it is also so uncertain when they may stop, that we cannot reduce the passages to form a musical bar, in any time whatsoever.

The second is, that the pitch of most birds is considerably higher * than the most shrill notes of those instruments which contain even the greatest compass.

* Dr. Wallis is mistaken in part of what he supposes to be the cause of shrillness in the voice, “*Nam ut tubus, sic trachea longior, & strictior, sonum efficit magis acutum.*” Grammar, p. 3.

The narrower the pipe is, the more sharp the pitch as he rightly observes; but the length of the tube hath just the contrary effect, because players on the flute always insert a longer middle-piece, when they want to make the instrument more flat.

I have

I have before said, that our ideas of a voice, or instrument, being perfectly in tune or not, arise from comparing it with the musical intervals to which we are most accustomed.

As the upper and lower parts of every instrument, however, are but seldom used, we are not so well acquainted with the intervals in the highest and lowest octaves, as we are with those which are more central; and for this reason the harpsichord-tuners find it more difficult to tune these extreme parts.

As a bird's pitch, therefore, is higher than that of any instrument, we are consequently at a still greater loss when we attempt to mark their notes in musical characters, which we can so readily apply to such as we can distinguish with precision.

The third, however, and unsurmountable difficulty is, that the intervals used by birds are commonly so minute, that we cannot judge at all of them from the more gross intervals into which we divide our musical octave.

It should therefore be recollected, by those who have contended that the Greeks and Romans were acquainted with such more minute intervals of the octave, that they must insist the ancients had organs of sensation, with which their degenerate posterity are totally unprovided.

Though we cannot attain the more delicate and imperceptible intervals in the song of birds *, yet many of them are capable of whistling tunes with our more gross intervals, as is well known by the

* There have been instances indeed of persons who would whistle the notes of birds, but these are too rare to be argued from.

common instances of piping Bullfinches *, and Canary-birds.

This, however, arises from mere imitation of what they hear when taken early from the nest; for if the instrument from which they learn is out of tune, they as readily pipe the false, as the true notes of the composition.

The next point of comparison to be made between our music and that of birds is, whether they always sing in the same pitch.

This, however, I will not presume to answer with any precision, for the reason I have before suggested; I shall, however, without reserve, give the best conjectures I can form on this head.

If a dozen singing birds of different kinds are heard in the same room, there is not any disagreeable dissonance (which is not properly resolved), either to my own ear, or to that of others, whose judgement on such a point I can more rely.

At the same time, as each bird is singing a different song, it is extraordinary that what we call harmony should not be perpetually violated, as we experience, in what is commonly called a Dutch concert, when several tunes are played together.

The first requisite to make such sounds agreeable to the ear is, that all the birds should sing in the same key, which I am induced to believe that they do, from the following reasons.

I have long attended to the singing of birds, but if I cannot have recourse to an instrument very soon,

* These Bullfinches also form a small article of commerce, and are chiefly brought from the neighbourhood of Cologne.

I cannot carry the pitch of their notes in my memory, even for a very short time.

I therefore desired a very experienced harpsichord-tuner (who told me he could recollect any particular note which he happened to hear for several hours), to mark down when he returned home what he had observed on this head.

I have lately received an account from him of the following notes in different birds.

F. natural in woodlarks.

A. natural in common cocks.

C. natural in Bantam cocks.

B. flat in a very large cock.

C. falling to A. commonly in the cuckow.

A. in thrushes.

D. in some owls.

B. flat in some others.

These observations furnish five notes, viz. A. B. flat, C. D. and F. to which I can add a sixth, (viz. G.) from my own observations on a nightingale which lived three years in a cage. I can also confirm these remarks of the harpsichord-tuner by having frequently heard from the same bird C. and F.

As one should speak of the pitch of these notes with some precision, the B. flat of the spinnet I tried them by, was perfectly in tune with the great bell of St. Paul's.

The following notes, therefore, having been observed in different birds, viz. A. B. flat, C. D. F. and G. the E. is only wanting to compleat the scale; the six other notes, however, afford sufficient data for making some conjectures, at least, with regard to the key in which birds may be supposed to sing,

as these intervals can only be found in the key of F. with a sharp third, or that of G. with a flat third.

I must own, I should rather suppose it to be the latter, and for the following reasons.

Lucretius says (and perhaps the conjecture is not only ingenious but well founded), that the first musical notes were learned from birds :

“ At liquidas avium voces imitauer ore

“ Ante fuit multo, quam lævia carmina cantu

“ Concelebrare homines possent, cantuque juvare.”

Now, of all the musical tones which can be distinguished in birds, those of the cuckow have been most attended to, which form a flat third, not only by the observations of the harpsichord tuner I have before mentioned, but likewise by those of Kircher, in his *Musurgia*.

I know well that there have been some late compositions, which introduce the cuckow notes in a sharp third ; these composers, however, did not trouble themselves with accuracy in imitating these notes, and it answered their purpose sufficiently, if there was a general resemblance.

Another proof of our musical intervals being originally borrowed from the song of birds, arises from most compositions being in a flat third, where music is simple, and consists merely of melody.

The oldest tune I happen to have heard is a Welsh one, called *Morvar Rhydland* *, which is

* Or *Rhydland Marsh*, where the Welsh received a great defeat ; Rhydland is in Flintshire. We find also, by the *Orpheus Britannicus*, that even so late as the time of Purcell, two parts in the three of his compositions are in the flat third.

composed in a flat third; and if the music of the Turks and Chinese is examined in Du Halde and Dr. Shaw, half of the airs are also in a flat third.

The music of two centuries ago is likewise often in a flat third, though ninety-nine compositions out of a hundred are now in the sharp third.

The reason, however, of this alteration seems to be very clear: the flat third is plaintive, and consequently adapted to simple movements, such as may be expected in countries where music hath not been long cultivated.

There is on the other hand a most striking brilliancy in the sharp third, which is therefore proper for the amazing improvements in execution, which both singers and players have arrived at within the last fifty years.

When Corelli's music was first published, our ablest violinists conceived that it was too difficult to be performed; it is now, however, the first composition which is attempted by a scholar. Every year also now produces greater and greater prodigies upon other instruments, in point of execution.

I have before observed, that by attending to a nightingale, as well as a robin which was educated under him, I always found that the notes reducible to our intervals of the octave were precisely the same; which is another proof that birds sing always in the same key.

In this circumstance, they differ much from the human finger; because those who are not able to *sing at sight*, often begin a song either above or below the compass of their voice, which they are not therefore able to go through with. As birds, however, form the same passages with the same notes,

Compositions for two piping

Allegretto

1st B.

2^d B.

1st B.

2^d B.

Allegro

1st B.

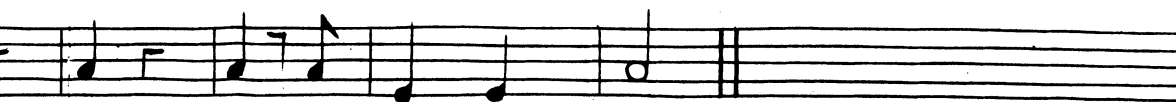
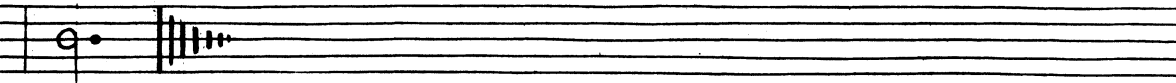
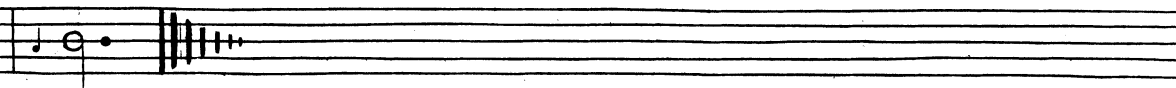
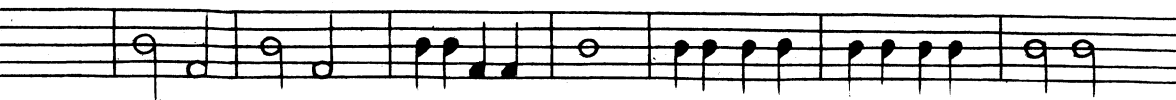
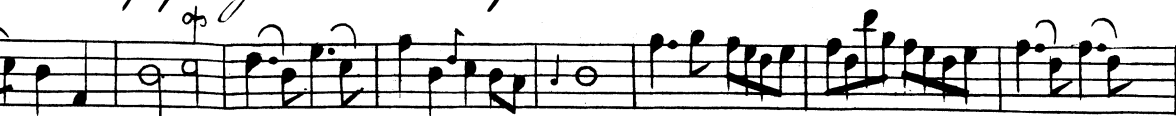
2^d B.

Allegro

1st B.

2^d B.

Or two piping Bullfinches



at all times, this mistake of the pitch can never happen in them.

Few singers again can continue their own part, whilst the same passages are sung by another in a different key; or if the same or other passages are sung, so as not to coincide with the musical bar, or time of the first singer.

As birds however adhere so steadfastly to the same precise notes in the same passages, though they never trouble themselves about what is called *time* in music; it follows that a composition may be formed for two piping bulfinches, in two parts, so as to constitute true harmony, though either of the birds may happen to begin, or stop, when they please.

I have therefore procured such an ingenious composition, by a very able musician *, which I send herewith; and it need scarcely be observed, that there cannot possibly be much variety in the part of the second bulfinch. [See TAB. XI.]

Though several birds have great musical powers, yet they seem to have no delicacy of sensations, as the human finger hath; and therefore the very best of them cannot be taught to exceed the insipidity of the upper part of the flute stop of an organ †, which hath not the modern improvement of a *swell*.

* Mr. Zeidler, who plays the violincello at Covent Garden theatre.

† Lord Bacon mentions, that in the instrument called a *regall* (which was a species of portable organ), there was a *nightingale* stop, in which water was made use of to produce the stronger imitation of this bird's tone. See Cent. ii. exper. 172. Though this instrument, as well as its *Nightingale* stop, is now disused, I have procured an organ pipe to be immersed partly in water, which, when blown into, hath produced a tone very similar to that of birds.

They

They are also easily imposed upon by that most imperfect of all instruments, a *bird-call*, which they often mistake for the notes of their own species.

I have before observed, that perhaps no bird may be said to sing which is larger than a blackbird, though many of them are taught to speak: the smaller birds, however, have this power of imitation; though perhaps the larger ones have not organs which may enable them, on the other hand, to sing.

We have the following instances of birds being taught to speak, in the time of the Greeks and Romans, upon which we never try the same experiment. Moschus addresses nightingales and swallows which were thus instructed:

Ἀδονίδες, πασαι τε χελιδόνες, ας ποκ' ἐέρπεν,
 Ἀς λαλεῖν ἐδίδασκε.

Moschi Idyl. iii.

Pliny mentions both a cock, thrush, and nightingales, which articulated *:

“Habebant & Cæsares juvenes turdum †, item
 “*lusciniæ* Græco atque Latino sermone dociles, præ-
 “*terea* meditantés in diem, & assidue nova lo-
 “*quentes* longiore etiam contextu.”

Statius also takes notice of some birds speaking, which we never attempt to teach in this manner:

* Lib. x. c. 21 & 42.

† Ibid. The other *turdus* belonged to the Empress Agrippina.

" Huc doctæ stipentur aves, queis nobile fandi
 " Jus natura dedit, plangat Phœbeius ales,
 " Auditasque memor penitus demittere voces
 " Sturnus, & Aonio versæ certamine picæ;
 " Quique refert jungens iterata vocabula perdix,
 " Et quæ Bistonio queritur soror orba cubili *."

Stat. Sylv. lib. ii. ecl. 4.

* Amongst the five birds mentioned in these lines of Statius, there are four which are never taught to speak at present, viz. the cock, the nightingale, the common, and the red legged partridge.

As I suppose, however, that *perdix* signifies this last bird, and not the common partridge (as it is always translated), it is proper I should here give my reasons why I dissent from others, as also why I conceive that *sturnus*, in this passage, is not a *starling*, but the common partridge.

None of the ancients have described the plumage of the *perdix*; but Aristotle, Ovid, and Pliny, inform us of what materials the nest of this bird is composed, as well as where it is placed.

Aristotle says, that the nest is *fortified with wood*^a; and in another chapter^b, with *thorns and wood*; neither of which are used by the common partridge, which often builds in a country where they cannot be procured.

On the contrary, M. de Buffon informs us, that the red legged partridge, "*se tiennent sur les montagnes qui produisent beaucoup de bruyeres, & de broissilles*"^c.

^a Επηλυγαζομενας υλην. Lib. v. c. 1. Which Stephens renders *making a covering of wood*.

^b Lib. ix. c. 8. The common partridge, however, makes its nest with hay and straw.

^c Orn. T. II. p. 433.

Silius Italicus also describes the *pernix* as being found in the same sort of country,

" Ceu *pernix*, quam densa vagis latratibus implet:
 " Venator *dumeta* Lacon." Lib. iii. l. 29.

As we find, from these citations, that so many different sorts of birds have learned to speak, and as I have shewn that a sparrow may be taught to

Ovid, therefore, speaking of the *perdix*, says,

“ ——— ponitque in sepibus ova ^d,”

where the common partridge is seldom known to build.

Pliny again informs us, “ *perdices spinâ & frutice sic muniant receptaculum, ut contra feras abunde valentur* ^e”, as also in the 52d chapter of his tenth book, that the *perdix* lays white eggs, which is not true of the common partridge.

But there are not wanting other proofs of the conjecture I have here made.

Aristotle, speaking of this same bird, says, ὅτι μὲν κακκαβίζουσιν, οἱ δὲ πρῖνοι ^f.

Now, the word κακκαβίζουσι is clearly formed from the call of the bird alluded to, which does not at all resemble that of the common partridge.

Thus also the author of the Elegy on the Nightingale, who is supposed by some to be Ovid, hath the following line:

“ *Caccabat hinc perdix, hinc gratitat improbus anser.*”

so that the call of the bird must have had something very particular, and have answered nearly, to the words κακκαβίζει and *caccabat*.

I find, indeed, that M. de Buffon contends ^g that the *περδίξ* of Aristotle does not mean the common partridge, but the bartavel, with regard to which, I shall not enter into any discussion, but only observe, that most of his references are inaccurate, and that he entirely mistakes the materials of which the nest is composed, according to Aristotle's sixth book, and first chapter.

^d Ovid. Met. lib. viii. l. 258. I shall also refer to l. 237, of the same book:

“ *Garrula ramosa prospexit ab ilice perdix:*”

as it is well known that the common partridge never perches upon a tree.

^e Lib. x. c. 23.

^f Lib. iv. c. 9.

^g Orn. T. II. p. 422.

sing

sing the linnet's note, I scarcely know what species to fix upon, that may be considered as incapable of such imitations; for it is very clear, from several experiments before stated, that the utmost endeavours will not be wanting in the bird, if he is endowed with the proper organs.

It can therefore only be settled by educating a bird, under proper circumstances, whether he is thus qualified or not; for if one was only to determine this point by conjecture, one should suppose

If, indeed, M. de Buffon had not been thus inaccurate, the grass and leaves, of which he says it is made, would prove that Aristotle speaks of the common partridge, contrary to what he himself supposes.

But the strongest proof that *perdix* signifies the red legged partridge is, that the Italians to this day call this bird *pernice*^h, and the common sort *starna*ⁱ.

This also now brings me to the proofs, of *sturnus* in this passage of Statius signifying the *common partridge*, and not the *starling*, which I must admit are not so strong as with regard to the import of the word *perdix*. If my arguments are not therefore so convincing on this head, the number of birds taught to speak by the Romans, and not by us, must be reduced to three, as the starling is frequently learned to talk in the present times.

As I cannot argue from the description of the habits of the *sturnus*, or the materials of its nest, as in the former instance, I must rest my conjecture (such as it is) on the two birds, almost following each other in these lines of Statius; on the common partridge being called *starna* to this day by the Italians, and upon the Romans having had otherwise no name for our partridge (which is a very common bird in Italy), if *sturnus* is supposed to signify only a *starling*.

^h I cannot therefore but think that *pernix*, according to the reading in the passage of Silius Italicus, which I have before cited, is the true Latin name for this bird, and that it was called *perdix* by those only who understood Greek.

ⁱ See Olina.

that a sparrow would not imitate the song of the linnet, nor that a nightingale or partridge could be taught to speak.

And here it may not be improper to explain what I mean by birds learning to imitate the notes of others, or the human speech.

If the birds differ little in shape or size (particularly of the beak *), the imitation is commonly so strong, that

* It seems very obvious why the form and size of the beak may be material; but I have also observed, that the colour of a bird's bill changes, when in or out of song; and I am informed that a cock seldom crows much, but when his comb is red.

When most of the finch tribe are coming into song, there is such a gradual change in the colour of their bill; thus, those of the chaffinch and linnet are then of a very deep blue, which fades away again, when the bird ceases to be in song.

This particular should be attended to by the ornithologist, in his description; because otherwise he supposes the colour of the bill to be permanent, which is by no means so.

This alteration, however, rather seems to be the symptom than the cause of a bird's coming into song, or otherwise, and I have never attended to this circumstance in the soft billed birds sufficiently, to say whether it holds also with regard to them.

A very intelligent bird-catcher, however, was able to prognosticate, for three winters together, when a nightingale, which I kept so long, was coming into song (though there was no change in the colour of the bill), by the dung's being intermixed with large bloody spots, which before was only of a dead white.

This same bird-catcher was also very successful in his prescriptions for sick birds, with regard to the ingredients of which he was indeed very mysterious.

He said, that as he could not feel their pulse, the circumstances which he chiefly attended to were their weight, as well as both the consistence and colour of their dung.

He always frankly said what he expected from his prescriptions, and that if such and such changes did not soon take place,

“ Mirè

“ Mirè sagaces falleret hospites

“ Discrimen obscurum.” Horat.

for, in such instances, the passages are not only the same, but the tone.

Such was the event of the experiment I have before mentioned of the linnet educated under a vengolina.

In my experiment, however, of teaching the sparrow the notes of the linnet, though the scholar imitated the passages of its master, yet the tone of the sparrow had by no means the mellowness of the original.

The imitation might therefore be, in some measure, compared to the singing of an opera song by a black-guard, when, though the notes may be precisely the same, yet the manner and tone would differ very much.

Thus also the linnet, which I heard repeat the words *pretty boy*, did not articulate like a *parrot* or a *mino*, though, at the same time, the words might be clearly distinguished.

The education I have therefore been speaking of will not give new organs of voice to a bird, and the instrument itself will not vary, though the notes or passages may be altered almost at pleasure.

I tried once an experiment, which might indeed have possibly made some alteration in the tone of a bird, from what it might have been when the animal

the case was desperate. He frequently also refused to prescribe, if the bird felt too light in the hand, or he thought that there was not sufficient time to bring about an alteration in the dung.

was at its full growth, by procuring an operator who caponised a young blackbird of about six weeks old; as it died, however, soon afterwards, and I have never repeated the experiment, I can only conjecture with regard to what might have been the consequences of it.

Both Pliny * and the London poulterers agree that a capon does not crow, which I should conceive to arise from the muscles of the larynx never acquiring the proper degree of strength, which seems to be requisite to the singing of a bird, from Mr. Hunter's dissections.

But it will perhaps be asked, why this operation should not improve the notes of a nestling, as much as it is supposed to contribute to the greater perfection of the human voice.

To this I answer, that castration by no means infuses any such consequence; for the voices of much the greater part of Italian eunuchs are so indifferent, that they have no means of procuring a livelihood but by copying music, and this is one of the reasons why so few compositions are published in Italy, as it would starve this refuse of society.

But it may be said, that there hath been a Farinelli and a Manzoli, whose voices were so distinguishedly superior.

To this I again answer, that the catalogue of such names would be a very short one; and that we attribute those effects to castration, which should rather be ascribed to the education of these singers.

* Lib. x. c. 21.

Castration commonly leaves the human voice at the same pitch as when the operation is performed; but the eunuch, from that time, is educated with a view only to his future appearance on the opera stage; he therefore manages his voice to greater advantage, than those who have not so early and constant instruction.

Considering the size of many singing birds, it is rather amazing at what a distance their notes may be heard.

I think I may venture to say, that a nightingale may be very clearly distinguished at more than half a mile *, if the evening is calm. I have also observed the breath of a robin (which exerted itself) so condensed in a frosty morning, as to be very visible.

To make the comparison, however, with accuracy, between the loudness of a bird's and the human voice, a person should be sent to the spot from whence the bird is heard; I should rather conceive that, upon such trial, the nightingale would be distinguished further than the man.

It must have struck every one, that, in passing under a house where the windows are shut, the singing of a bird is easily heard, when, at the same time, a conversation cannot be so, though an animated one.

Most people, who have not attended to the notes of birds, suppose that those of every species sing

* *Monf. de Buffon* says, that the quadruped which he terms the *huarine*, may be heard at the distance of a league. *Ornith. Tom. I.*

exactly the same notes and passages, which is by no means true, though it is admitted that there is a general resemblance.

Thus the London bird-catchers prefer the song of the Kentish goldfinches, but Essex chaffinches; and when they sell the bird to those who can thus distinguish, inform the buyer that it hath such a note, which is very well understood between them*.

Some of the nightingale fanciers also prefer a Surry bird to those of Middlesex†.

These differences in the song of birds of the same species cannot perhaps be compared to any thing more apposite, than the varieties of provincial dialects.

The nightingale seems to have been fixed upon, almost universally, as the most capital of singing birds, which superiority it certainly may boldly challenge: one reason, however, of this bird's being

* These are the names which they give to some of the nightingale's notes: *Sweet, Sweet jug, Jug sweet, Water bubble, Pipe rattle, Bell pipe, Scroty, Skeg, Skeg, Skeg, Swat swat swaty, Whitlow whitlow whitlow*, from some distant affinity to such words.

† Mr. Henshaw informs us, that nightingales in Denmark are not heard till May, and that their notes are not so sweet or various as with us. Dr. Birch's History of the Royal Society, Vol. III. p. 189. Whilst Mr. Fletcher (who was minister from Q. Elizabeth to Russia) says, that the nightingales in that part of the world have a finer note than ours. See Fletcher's Life, in the Biographia Britannica.

I never could believe what is commonly asserted, that the Czar Peter was at a considerable expence to introduce singing birds near Petersburg; because it appears, by the *Fauna Suecica*, that they have in those latitudes most of the same birds with those of England.

more

more attended to than others is, that it sings in the night *.

Hence Shakespeare says,

“ The nightingale, if she should sing by day,
 “ When every goose is cackling, would be thought
 “ No better a musician than the wren.”

The song of this bird hath been described, and expatiated upon, by several writers, particularly Pliny and Strada.

As I must own, however, that I cannot affix any precise ideas to either of these celebrated descriptions, and as I once kept a very fine bird of this sort for three years, with very particular attention to its song; I shall endeavour to do it the best justice I am capable of.

In the first place, its tone is infinitely more mellow than that of any other bird, though, at the same time, by a proper exertion of its musical powers, it can be excessively brilliant.

When this bird *sang its song round*, in its whole compass, I have observed sixteen different beginnings and closes, at the same time that the intermediate notes were commonly varied in their succession with such judgment, as to produce a most pleasing variety.

The bird which approaches nearest to the excellence of the nightingale, in this respect, is the skylark; but then the tone is infinitely inferior in point of mellowness: most other singing birds have not above four or five changes.

* The woodlark and reedsparrow sing likewise in the night; and from hence, in the neighbourhood of Shrewsbury, the latter hath obtained the name of the willow-nightingale. Nightingales, however, and these two other birds, sing also in the day, but are not then distinguished in the general concert.

The next point of superiority in a nightingale is its continuance of song, without a pause, which I have observed sometimes not to be less than twenty seconds. Whenever respiration, however, became necessary, it was taken with as much judgment as by an opera singer.

The skylark again, in this particular, is only second to the nightingale *.

* I shall here insert a table, by which the comparative merit of the British singing birds may be examined, the idea of which I have borrowed from Monf. de Piles, in his *Cours de Peinture par Principes*. I shall not be surprized, however, if, as he suggests, many may disagree with me about particular birds, as he supposes they will do with him, concerning the merits of painters.

As I have five columns instead of the four which M. de Piles uses, I make 20 the point of absolute perfection, instead of 16, which is his standard.

	Mellow- ness of tone.	Sprightly notes.	Plaintive notes.	Compass.	Execu- tion.
Nightingale	19	14	19	19	19
Skylark	4	19	4	18	18
Woodlark	18	4	17	12	8
Titlark	12	12	12	12	12
Linnet	12	16	12	16	18
Goldfinch	4	19	4	12	12
Chaffinch	4	12	4	8	8
Greenfinch	4	4	4	4	6
Hedge-sparrow	6	0	6	4	4
Aberdavine (or Siskin)	2	4	0	4	4
Redpoll	0	4	0	4	4
Thrush	4	4	4	4	4
Blackbird	4	4	0	2	2
Robin	6	16	12	12	12
Wren	0	12	0	4	4
Reed-sparrow	0	4	0	2	2
Black-cap, or the Norfolk Mock nightingale ^k	14	12	12	14	14

^k Brit. Zool. p. 262.

And here I must again repeat, that what I describe is from a caged nightingale, because those which we hear in the spring are so rank, that they seldom sing any thing but short and loud jerks, which consequently cannot be compared to the notes of a caged bird, as the instrument is overstrained.

I must also here observe, that my Nightingale was a very capital bird; for some of them are so vastly inferior, that the bird-fanciers will not keep them, branding them with the name of Frenchmen*.

But it is not only in tone and variety that the Nightingale excells; the bird also sings (if I may so express myself) with superior judgement and taste.

I have therefore commonly observed, that my Nightingale began softly like the ancient orators;

I have made no mention of the bulfinch in this table, which is commonly considered as a singing bird; because its wild note, without instruction, is a most jarring and disagreeable noise.

I have likewise omitted¹ the redstart (which is called by the French le Rossignol de Muraille), as I am not sufficiently acquainted with its song, though it is admired by many; I should rather conceive, however, with Zinanni, that there is no very extraordinary merit in the notes.

The London bird-catchers also sell sometimes the yellow hammer, twite and brambling^m as singing birds; but none of these will come within my definition of what may be deemed so.

* One should suppose from this, that the nightingale-catchers had heard much of the French music; which is possibly the case, as some of them live in Spittal-fields.

¹ Il culo ranzo é un uccello, (per quanto dicono) molto canoro, ma io tale non lo stimo. Delle uova é del nidi, p. 53.

^m They call this bird a kate.

reserving its breath to swell certain notes, which by this means had a most astonishing effect, and which eludes all verbal description.

I have indeed taken down certain passages which may be reduced to our musical intervals ; but though by these means one may form an idea of some of the notes used, yet it is impossible to give their comparative durations in point of musical tune, upon which the whole effect must depend.

I once procured a very capital player on the flute to execute the notes which Kircher hath engraved in his *Musurgia*, as being used by the nightingale ; when, from want of not being able to settle their comparative duration, it was impossible to observe any traces almost of the nightingale's song.

It may not be improper here to consider, whether the nightingale may not have a very formidable competitor in the American mocking-bird* ; though almost all travellers agree, that the concert in the European woods is superior to that of the other parts of the globe†.

As birds are now annually imported in great numbers from Asia, Africa, and America, I have frequently attended to their notes, both singly and in concert, which are certainly not to be compared to those of Europe.

Thomson, the poet, (whose observations in natural history are much to be depended upon) makes

* *Turdus Americanus minor canorus*. Ray's Syn. It is called by the Indians *Contlatolli* ; which is said to signify four hundred tongues. See also Catesby.

† See Rochefort's *Hist des Antilles*, T. I. p. 366.—Ph. Tr. Abr. Vo. III. p. 563.—and Catesby.

this superiority in the European birds to be a sort of compensation for their great inferiority in point of gaudy plumage. Our goldfinch, however, joins to a very brilliant and pleasing song, a most beautiful variety of colours in its feathers*.

It must be admitted, that foreign birds, when brought to Europe, are often heard to a great disadvantage; as many of them, from their great tameness, have certainly been brought up by hand, the consequence of which I have already stated from several experiments. The soft-billed birds also cannot be well brought over, as the *succedaneum* for insects (their common food) is fresh meat, and particularly the hearts of animals.

I have happened, however, to hear the American mocking-bird in great perfection at Mess. Vogle's and Scott's, in Love-lane, Eastcheap.

This bird is believed to be still living, and hath been in England these six years. During the space of a minute, he imitated the woodlark, chaffinch, blackbird, thrush, and sparrow. I was told also, that he would bark like a dog; so that the bird seems to have no choice in his imitations, though his pipe comes nearest to our nightingale of any bird I have yet met with.

With regard to the original notes, however, of this bird, we are still at a loss; as this can only be

* I cannot but think, that there would be a demand for these birds in China, as the inhabitants are very sedentary, and bird cages are commonly represented as hanging in their rooms. I have been informed, by a Tyroleze, that his best market for Canary birds was Constantinople.

known by those who are accurately acquainted with the song of the other American birds.

Kalm indeed informs us, that the natural song is excellent *; but this traveller seems not to have been long enough in America to have distinguished what were the genuine notes: with us, mimics do not often succeed but in imitations.

I have little doubt, however, but that this bird would be fully equal to the song of the Nightingale in its whole compass; but then, from the attention which the *mocker* pays to any other sort of disagreeable noises, these capital notes would be always debased by a bad mixture.

We have one mocking bird in England, which is the skylark; as, contrary to a general observation I have before made, this bird will catch the note of any other which hangs near it; even after the skylark note is *fixed*. For this reason, the bird-fanciers often place the skylark next one which hath not been long caught, in order, as they term it, to keep the caged skylark *honest*.

The question, indeed, may be asked, why the wild skylark, with these powers of imitation, ever adheres to the parental note; but it must be recollected, that a bird when at liberty is for ever shifting its place, and consequently does not hear the same notes eternally repeated, as when it hangs in a cage near another. In a wild state therefore the skylark adheres to the parental notes; as the parent cock attends the young ones, and is heard by them for so considerable a time.

* Vol. I. p. 219.

I am aware also, that it may be asked, how birds originally came by the notes which are peculiar to each species. My answer, however, to this is, that the origin of the notes of birds, together with its gradual progress, is as difficult to be traced, as that of the different languages in nations.

The loss of the parent-cock at the critical time for instruction hath undoubtedly produced those varieties, which I have before observed are in the song of each species; because then the nestling hath either attended to the song of some other birds; or perhaps invented some new notes of its own, which are afterwards perpetuated from generation to generation, till similar accidents produce other alterations. The organs of some birds also are probably so defective, that they cannot imitate properly the parental note, as some men can never articulate as they should do. Such defects in the parent bird must again occasion varieties, because these defects will be continued to their descendants, who (as I before have proved) will only attend to the parental song. Some of these descendants also may have imperfect organs; which will again multiply varieties in the song.

The truth is, as I before observed, that scarcely any two birds of the same species have exactly the same notes, if they are accurately attended to, though there is a general resemblance.

Thus most people see no difference between one sheep and another, when a large flock is before them. The shepherd, however, knows each of them, and can swear to them, if they are lost; as can the Lincolnshire gosherd to each goose.

As I now draw towards a conclusion of both my experiments and observations on the singing of birds; it may be possibly asked, what use results either from the trouble or expence which they have cost me; both of which I admit to have been considerable.

I will readily own, that no very important advantages can be derived from them; and yet I shall not decline suggesting what little profit they may possibly be of, though at best they should rather be considered as what Lord Bacon terms, *experiments of light, than of fruit.*

In the first place, there is no better method of investigating the human faculties, than by a comparison with those of animals; provided we make it without a most ungrateful wish of lowering ourselves, in that distinguished situation in which we are placed.

Thus we are referred to the ant for an example of industry and foresight, because it provides a magazine of food for the winter, when this animal is in a state of torpidity during that season; nor are we less willing to suppose the song of birds to be superior to our own musical powers.

The notes of many birds are certainly very pleasing, but can by no means stand in competition either with the human voice or our worst musical instruments; not only from want of the striking effects of harmony in many excellent compositions; but because, even when compared to our simple melody, expression is wanting*, without which music is so languid and inanimate.

* The nightingale, indeed, is perhaps an exception to this general observation.

But

But to return to the uses (such as they are) which may arise from attending to the song of birds, or from the experiments which I have given an account of.

The first of these is too much neglected by the naturalist; for, if the bird is not caught, the only means often by which either the sex or the species can be determined is the song. For example, if Mons. Adanson had informed us whether the European swallows, which he conceived were to be seen during the winter at Senegal, had the same notes with those of Europe, it would have been going one step further in proof of the facts which he and others so much rely upon.

These experiments, however, may be said to be useful to all those who happen to be pleased with singing birds; because it is clear, that, by educating a bird under several sorts, we may often make such a mixture, as to improve the notes which they would have learned in a wild state.

It results also from the experiment of the linnet being educated under the Vengolina, that we may introduce the notes of Asia, Africa, and America, into our own woods; because, if that linnet had been set at liberty*, the nestlings of the next season would have adhered to the Vengolina song, who would again transmit it to their descendants.

* I know well, that it is commonly supposed, if you set a caged bird at liberty, it will neither be able to feed itself, nor otherwise live long, on account of its being persecuted by the wild ones. There is no foundation, however, for this notion; and I take it to arise from an excuse for continuing to keep these birds in confinement.

But

But we may not only improve the notes of birds by a happy mixture, or introduce those which were never before heard in Great-Britain ; as we may also improve the instrument with which the passages are executed.

If, for example, any bird-fancier is particularly fond of what is called the song of the Canary bird, which however must be admitted to be inferior in tone to the linnet, it would answer well to any such person, if a nestling linnet was brought up under a Canary bird, because the notes would be the same, but the instrument which executes them would be improved.

We learn also, from these experiments, that nothing is to be expected from a nestling brought up by hand, if he does not receive the proper instruction from the parent cock : much trouble and some cost is therefore thrown away by many persons in endeavouring to rear nestling nightingales, which, when they are brought up and fed at a very considerable expence, have no song which is worth attending to.

If a woodlark, or skylark, was educated, however, under a nightingale, it follows that this charge (which amounts to a shilling per week *) might be in a great measure saved, as well as the trouble of chopping fresh meat every day.

A nightingale, again, when kept in a cage, does not live often more than a year or two ; nor does he sing more than three or four months ; whereas the

* Olina speaks of a paste which is used in Italy for nightingales ; but I cannot find that it ever answers with us ; perhaps, they bring their nightingales up by hand, and so accustom them from their earliest infancy to such food.

scholar pitched upon may not only be more vivacious, but will continue in song nine months out of the twelve.

I fear, however, that I have already dwelt too long upon these very minute and trifling advantages which may result from my experiments and observations; I shall therefore no longer defer subscribing myself,

Dear Sir,

Your most faithful,

Humble Servant,

Daines Barrington: